



U.S. Department of Energy
Energy Efficiency and Renewable Energy

FY 2005 Wind Program Overview

Wind Energy Program



Brian Smith

Technology Manager

National Renewable Energy Laboratory

Wind & Hydropower Technologies
Program

Wind Program R&D Implementation Meeting

Broomfield, Colorado

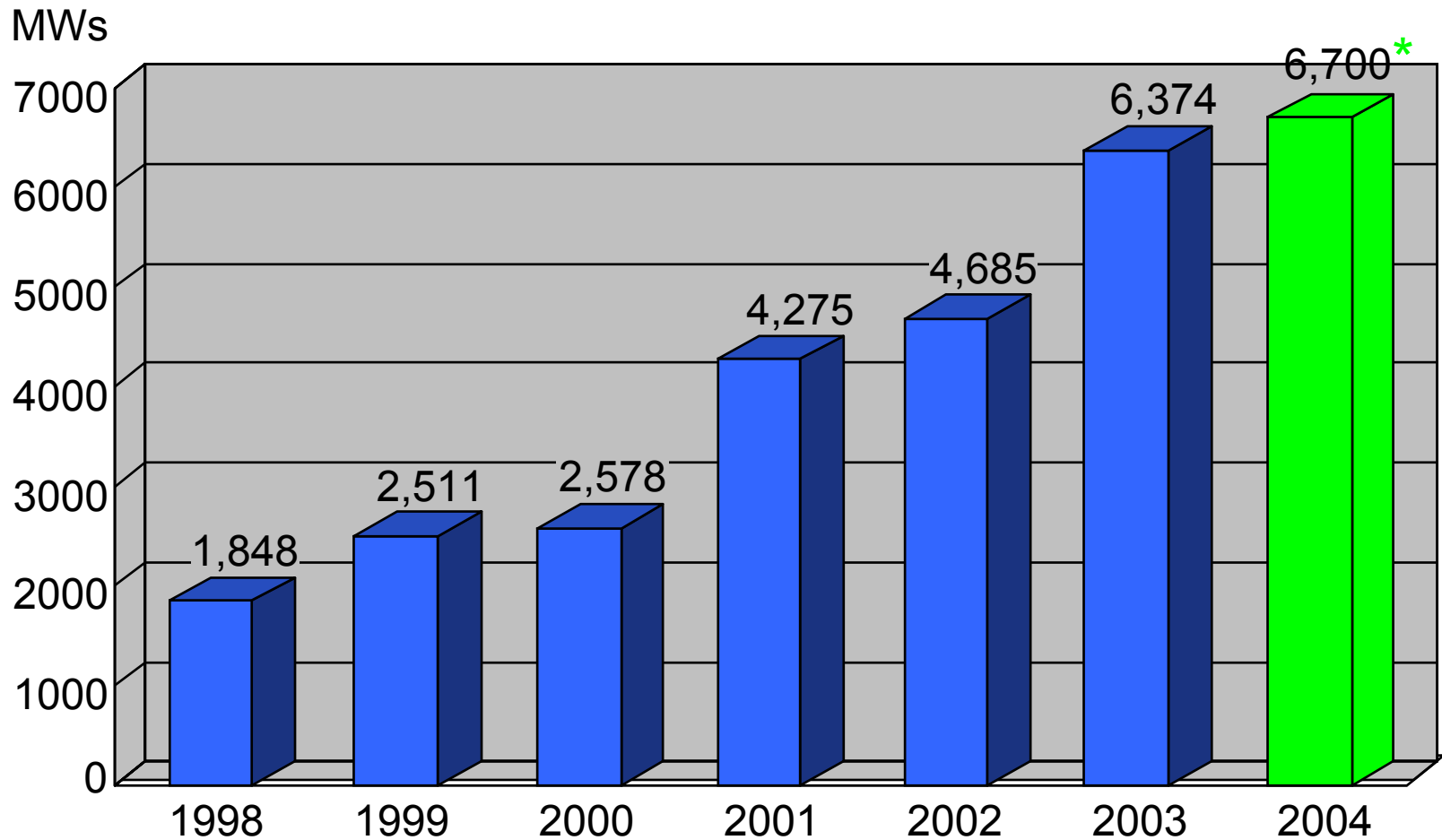
November 16, 2004



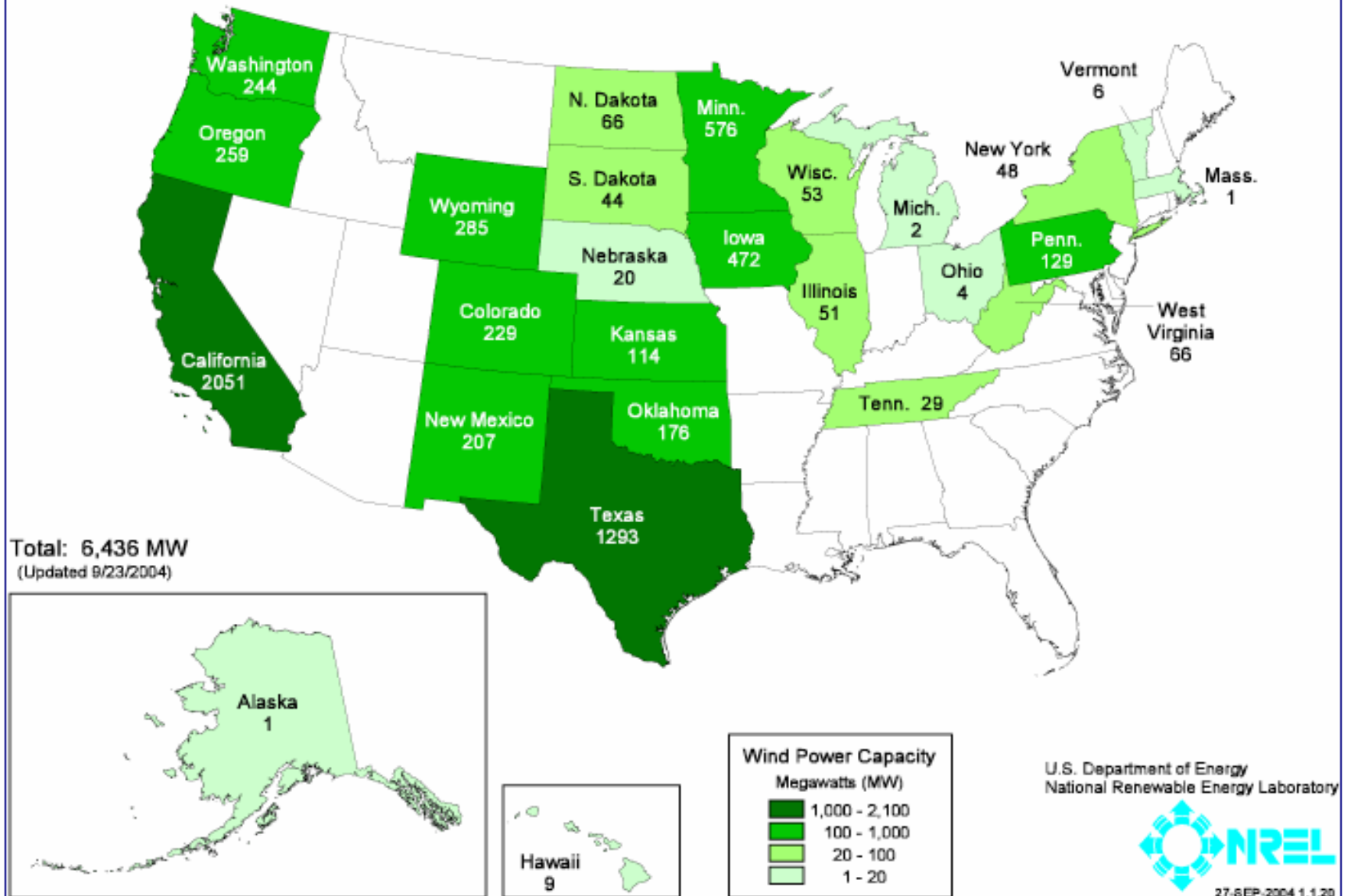
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U.S. Wind Energy Capacity

(*Estimate provided by AWEA based on passage of PTC in early fall 2004)



United States - 2004 Expected Year End Wind Power Capacity (MW)

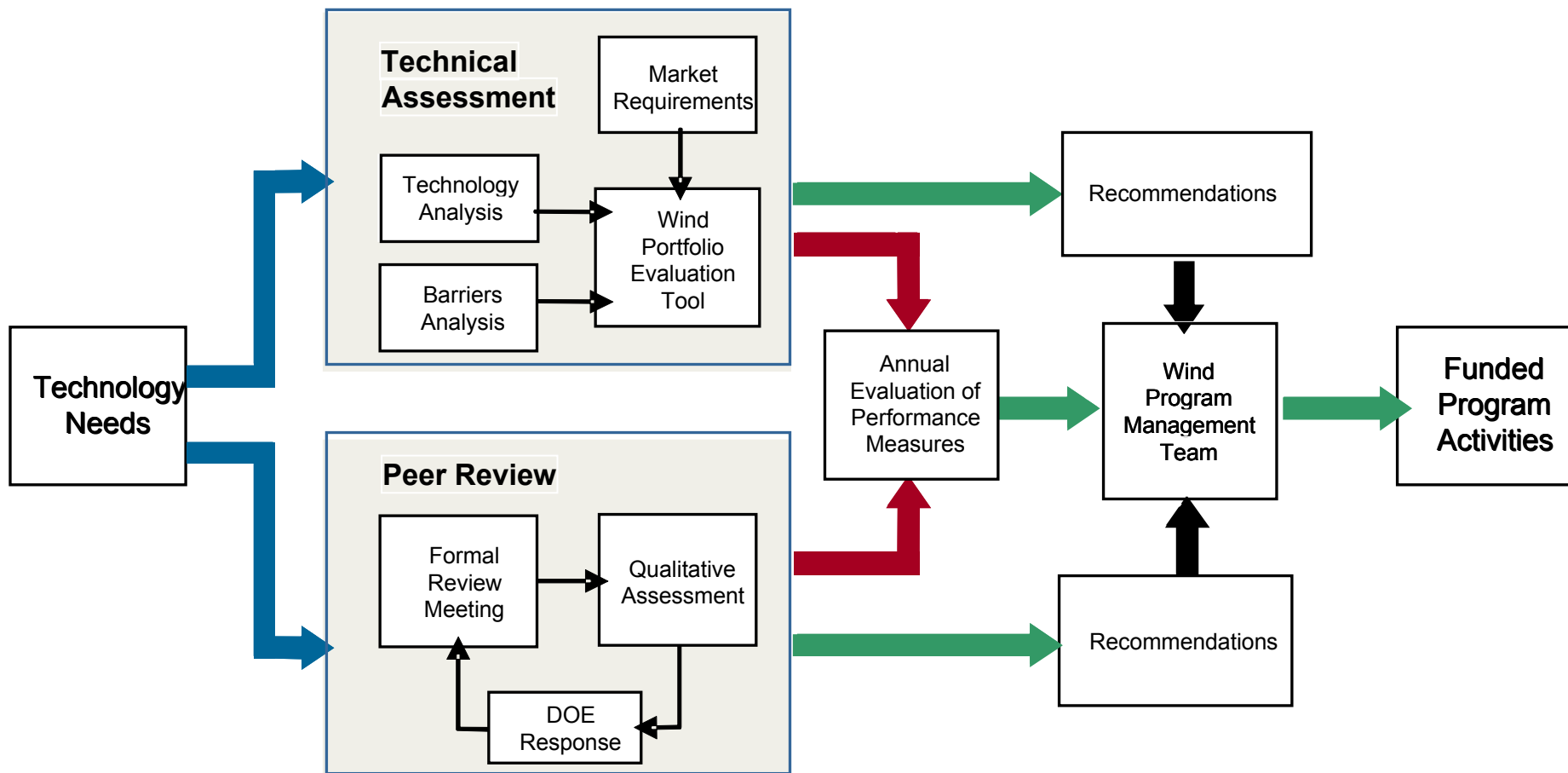


(Estimate provided by GEC based on 2004 completed and in-ground projects)



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Program Planning Concept





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MYPP and AOP



Harnessing America's
abundant natural resources
for clean power generation

Wind and Hydropower Technologies Program

Wind Energy Multi Year Program Plan For 2005-2010

Draft October 2004



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Bringing you a prosperous future where energy is clean,
efficient, reliable, and affordable



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Wind and Hydropower Technologies Program WIND ENERGY PROGRAM

FY 2005 Annual Operating Plan

DRAFT Revision 0.0
October 1, 2004

Approved by: _____ Date: _____
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Program Manager, Wind and Hydropower Technologies
U.S. Department of Energy

Approved by: _____ Date: _____
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National Renewable Energy Laboratory

Wind & Hydropower Technologies Program: WIND ENERGY PROGRAM
Energy Efficiency and Renewable Energy
U.S. Department of Energy Washington, DC 20585



Program Elements

Technology Viability

Low Wind Speed Technology

Primary Program Activities:

- Public/private partnerships
 - Concepts
 - Components
 - Systems

Distributed Wind Technology

Primary Program Activities:

- Public/private partnerships
 - Concepts
 - Components
 - Systems

Technology Application

Systems Integration

Primary Program Activities:

- Models
- Ancillary costs
- Utility rules
- Transmission planning
- Technology synergies

Technology Acceptance

Primary Program Activities:

- State outreach
- Rural wind development
- Native Americans
- Power partnerships
- Stakeholder collaboratives

Program Goals

Goal A

By 2012, COE from large systems in Class 4 winds 3 cents/kWh onshore or 5 cents/kWh offshore

Goal B

By 2007, COE from distributed wind systems 10- 15 cents/kWh in Class 3

Goal C

By 2012, complete program activities addressing electric power market rules, interconnection impacts, operating strategies, and system planning needed for wind energy to compete without disadvantage to serve the Nation's energy needs

Goal D

By 2010, at least 100 MW will be installed in 30 states.

Supporting Research and Testing

Primary Program Activities:

- Enabling research
- Design Review and Analysis
- Testing Support

Supporting Engineering and Analysis

Primary Program Activities:

- Standards and certification
- Field verification test support
- Technical issues analysis and communications



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Wind Program Budget

(Dollars in Millions)

FY04/FY05 Subprograms	FY04 Budget	FY05 Request
Technology Viability	28.6	31.0
Technology Applications	11.0	10.6
Earmarks	1.4	0.0
Wind Energy Program	41.1	41.6

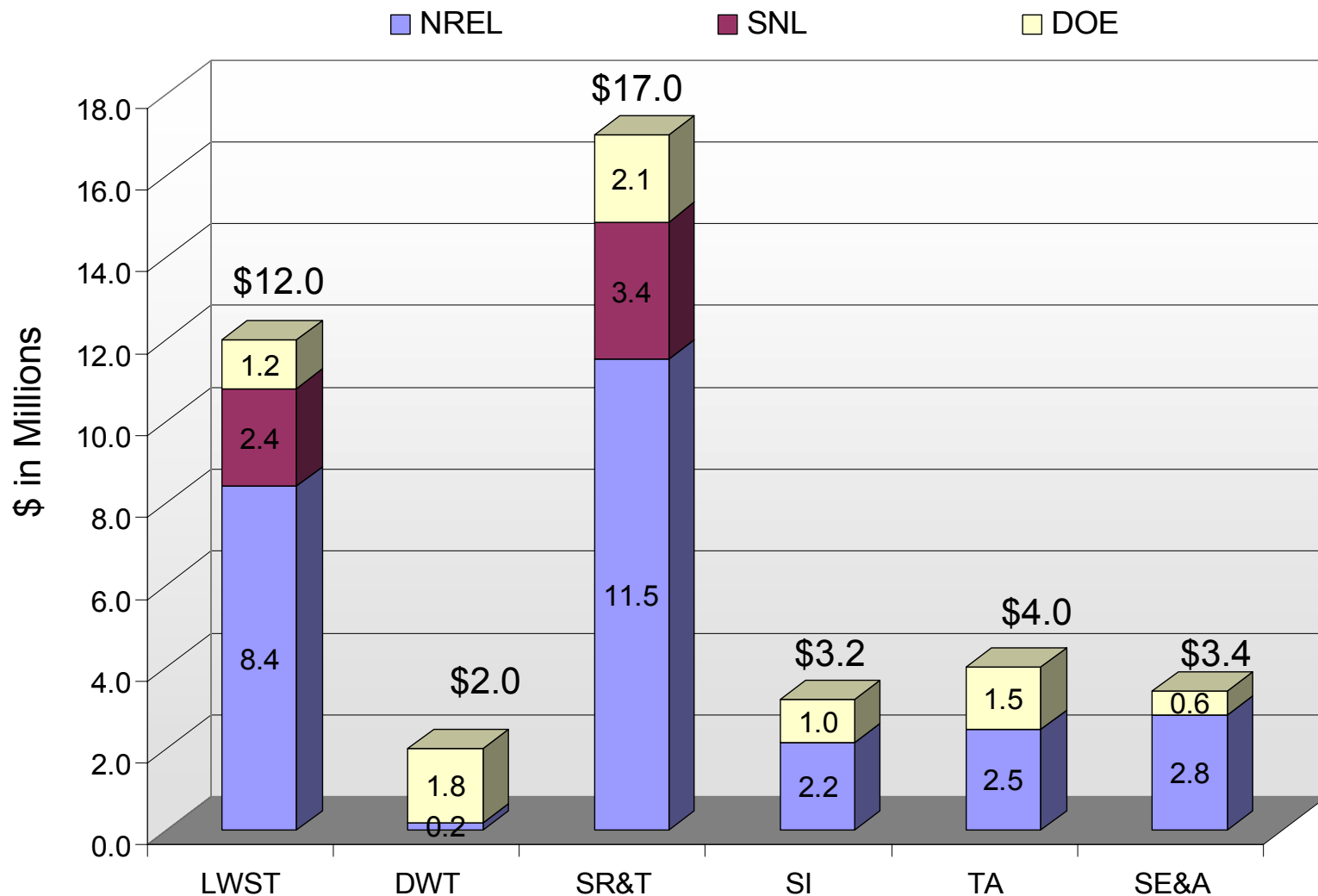


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Wind Program Budget

FY05 Funding by Key Activity

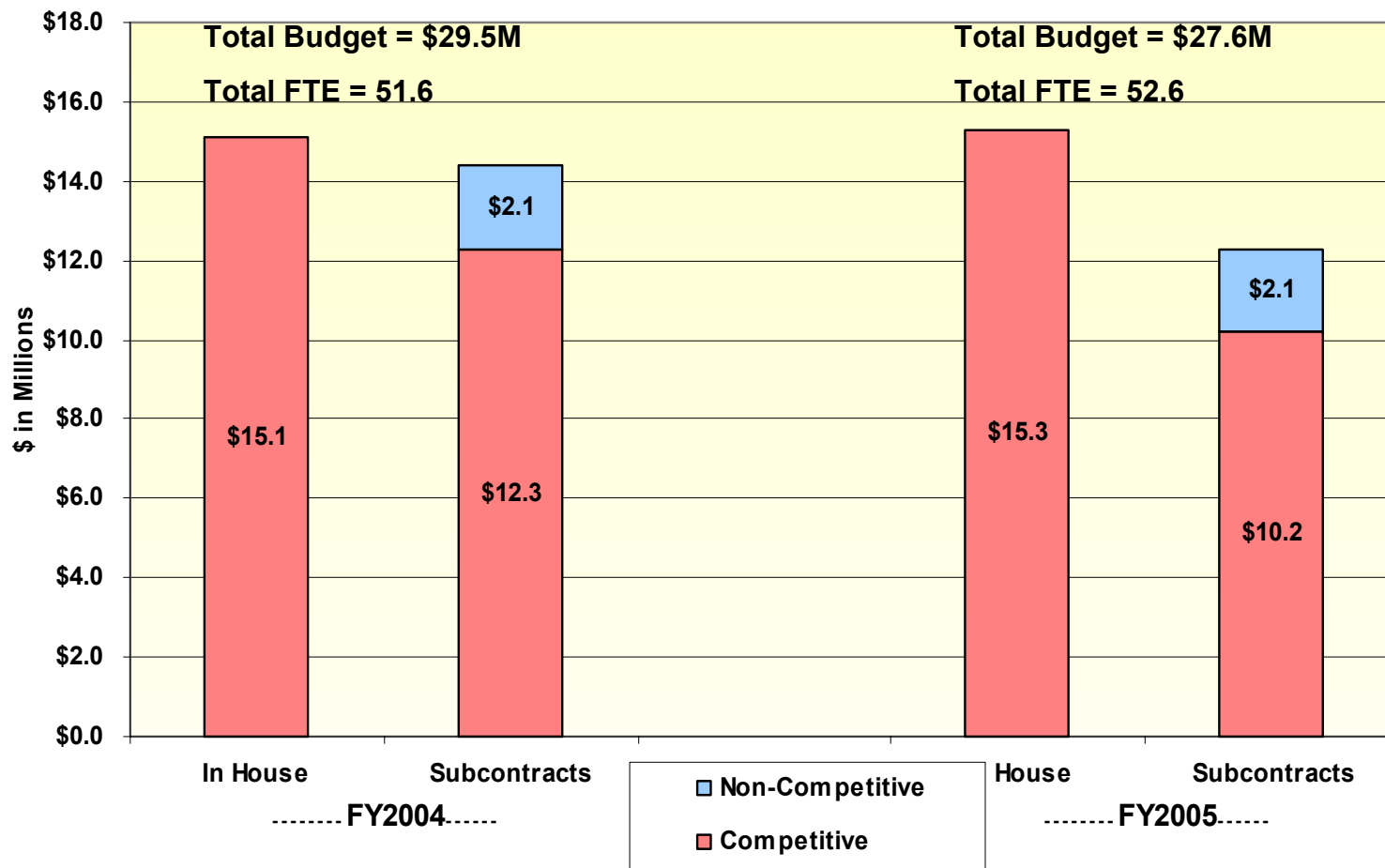
Total Funding \$41.6M





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NREL Wind & Hydropower Program Funding In House and Subcontracts FY2004 and FY2005 (est)

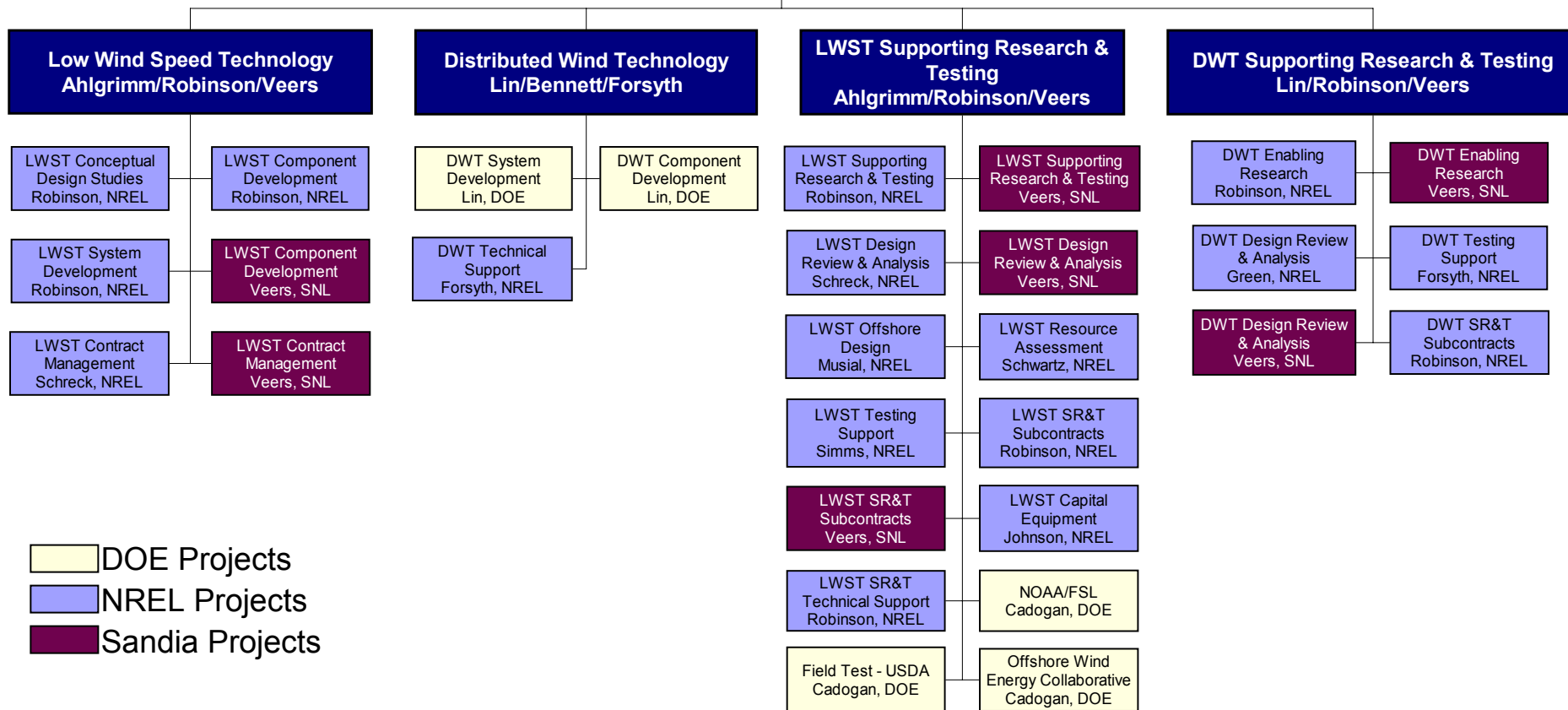




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Wind Energy Program Project Breakdown Structure

Technology Viability

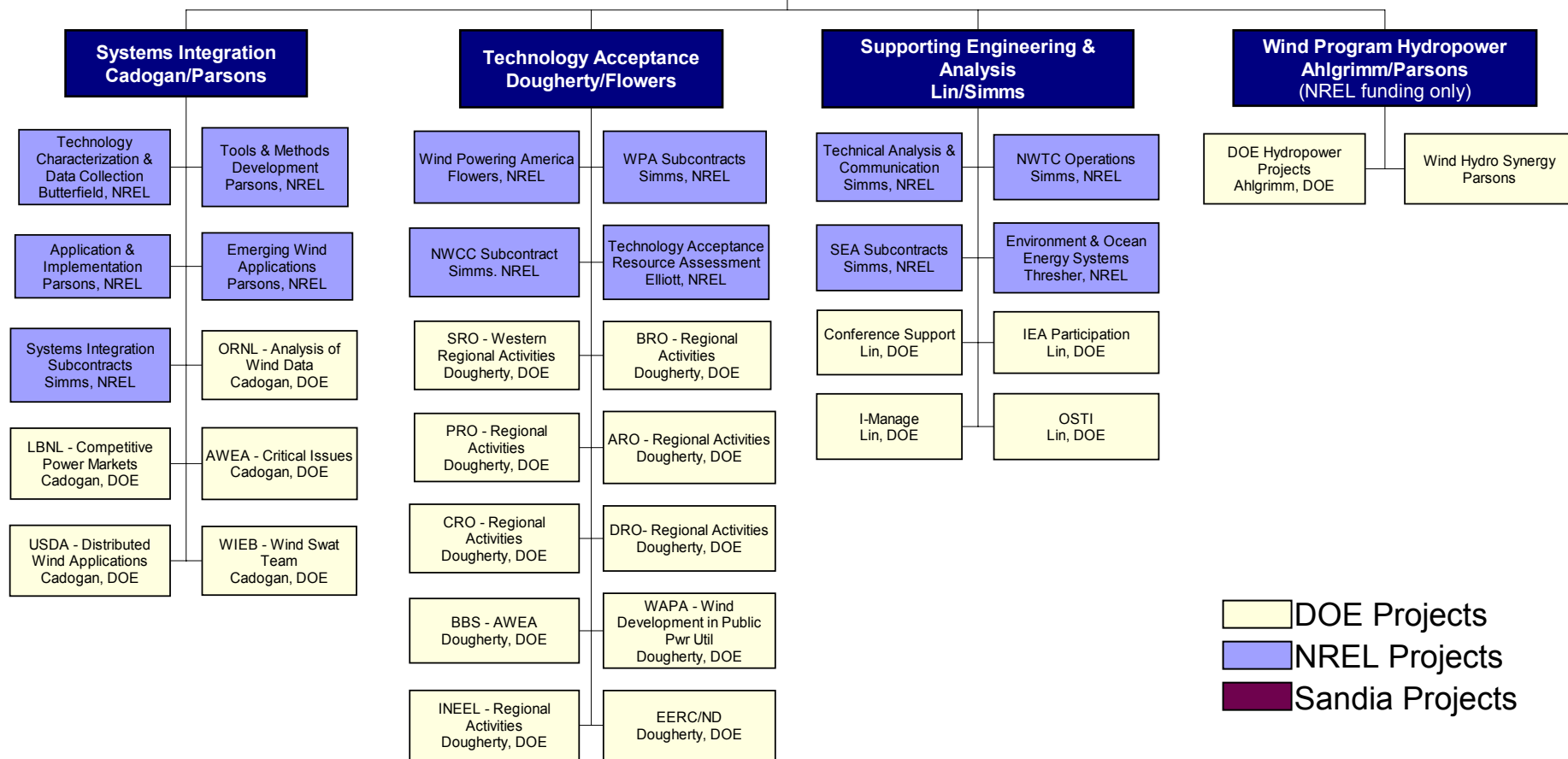




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Wind Energy Program Project Breakdown Structure

Technology Application

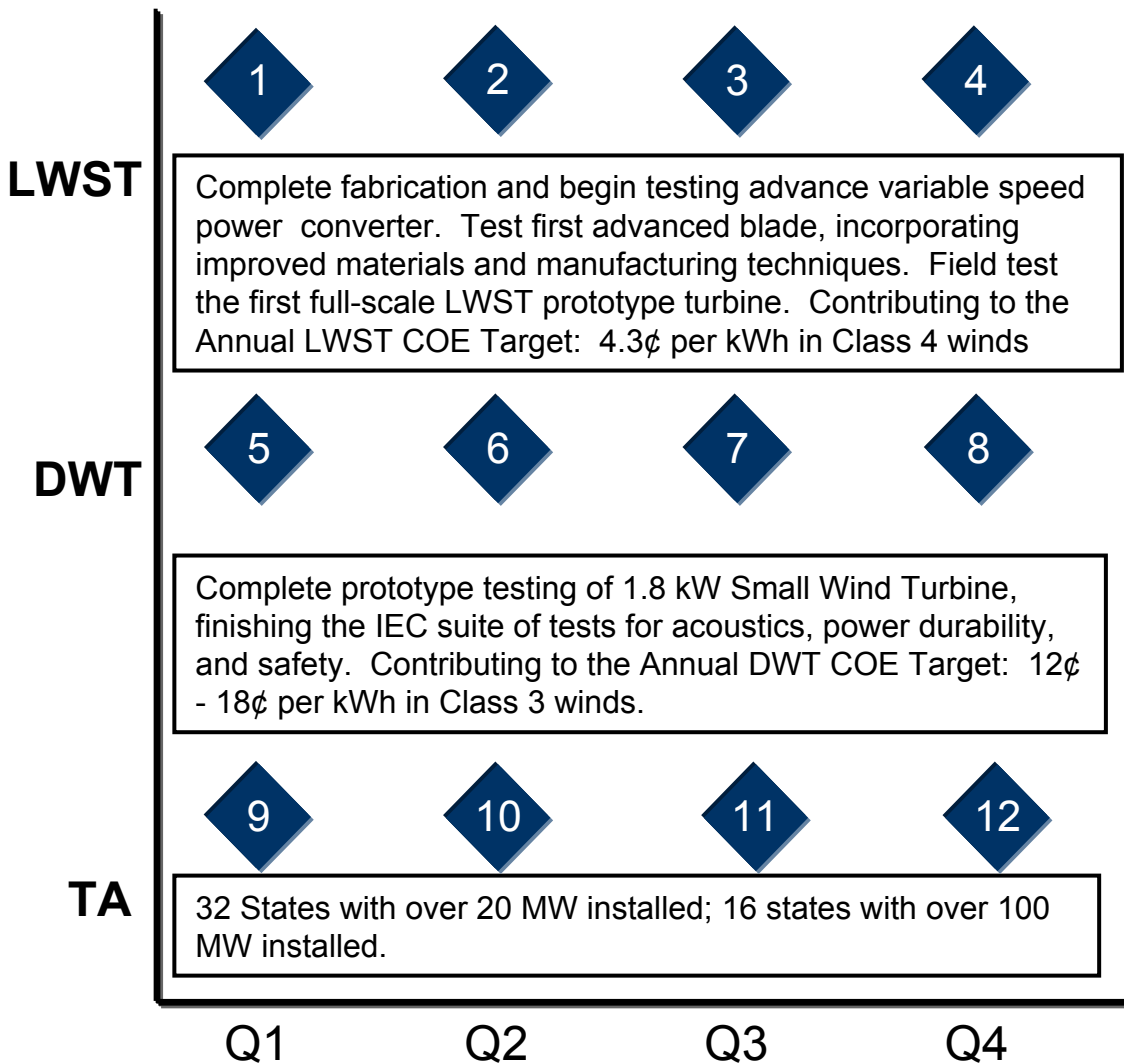




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Wind Energy Program

FY05 Joule Targets/Quarterly Milestones



1. Complete detailed design of advanced variable-speed power converter
2. Begin testing of subscale prototype carbon hybrid blade precursor to LWST megawatt scale advanced blade
3. Complete site selection for field testing of first full-scale LWST proof-of-concept turbine
4. Complete fabrication and begin testing advance variable speed power converter. Test first advanced blade, incorporating improved materials and manufacturing techniques. Field test the first full-scale LWST prototype turbine. Contributing to the Annual LWST COE Target: 4.3¢ per kWh in Class 4 winds
5. Complete installation of 1.8 kW wind turbine at the NWTC in preparation for field testing
6. Complete IEC Safety and Function Test on 1.8 kW wind turbine
7. Complete IEC acoustic and power performance tests on 1.8 kW wind turbine
8. Complete prototype testing of 1.8 kW Small Wind Turbine, finishing the IEC suite of tests for acoustics, power durability, and safety. Contributing to the Annual DWT COE Target: 12 - 18 cents per kWh in Class 3 winds
9. Provide technical and outreach support on wind technology at one public power wind event
10. Provide technical and outreach support for one multi-state, agricultural sector wind event
11. Convene nation-wide state wind work group (WWG) summit
12. 32 States with over 20 MW installed; 16 states with over 100 MW installed